All India Test Series (2023-24)

Test Code: ANY/03 | **AITS TEST - 03** | **YAKEEN NEET**

DURATION: 200 Minutes | **DATE: 04/02/2024** | **M. MARKS: 720**

ANSWER KEY

(PHYSICS)

SECTION-A

1.	(3)	8.	(2)	15.	(2)	22.	(4)	29.	(1)
2.	(2)	9.	(2)	16.	(1)	23.	(3)	30.	(1)
3.	(4)	10.	(4)	17.	(2)	24.	(3)	31.	(2)
4.	(3)	11.	(2)	18.	(3)	25.	(4)	32.	(2)
5.	(3)	12.	(2)	19.	(3)	26.	(2)	33.	(2)
6.	(4)	13.	(2)	20.	(1)	27.	(3)	34.	(2)
7.	(4)	14.	(2)	21.	(1)	28.	(3)	35.	(2)

SECTION-B

36.	(1)	39.	(3)	42.	(2)	45.	(2)	48.	(1)
37.	(1)	40.	(4)	43.	(3)	46.	(1)	49.	(2)
38.	(2)	41.	(4)	44.	(2)	47.	(2)	50.	(1)

(CHEMISTRY)

SECTION-A

51.	(4)	58.	(3)	65.	(3)	72.	(1)	79.	(4)
52.	(4)	59.	(4)	66.	(2)	73.	(4)	80.	(3)
53.	(4)	60.	(4)	67.	(1)	74.	(3)	81.	(4)
54.	(3)	61.	(2)	68.	(4)	75.	(3)	82.	(2)
55.	(1)	62.	(3)	69.	(2)	76.	(2)	83.	(4)
56.	(2)	63.	(1)	70.	(4)	77.	(2)	84.	(3)
57.	(3)	64.	(1)	71.	(3)	78.	(3)	85.	(3)

SECTION-B

86.	(2)	89.	(2)	92.	(3)	95.	(2)	98.	(3)
87.	(1)	90.	(2)	93.	(4)	96.	(3)	99.	(3)
88.	(3)	91.	(1)	94.	(3)	97.	(1)	100.	(1)

(BOTANY)

SECTION-A

101.	(3)	108.	(2)	115.	(2)	122.	(1)	129.	(2)
102.	(1)	109.	(2)	116.	(2)	123.	(1)	130.	(1)
103.	(3)	110.	(3)	117.	(2)	124.	(3)	131.	(3)
104.	(2)	111.	(3)	118.	(2)	125.	(2)	132.	(2)
105.	(3)	112.	(1)	119.	(3)	126.	(2)	133.	(4)
106.	(1)	113.	(3)	120.	(1)	127.	(3)	134.	(1)
107.	(3)	114.	(1)	121.	(1)	128.	(3)	135.	(1)

SECTION-B

136.	(1)	139.	(1)	142.	(4)	145.	(3)	148.	(3)
137.	(3)	140.	(1)	143.	(1)	146.	(2)	149.	(3)
138.	(1)	141.	(1)	144.	(4)	147.	(4)	150.	(2)

(ZOOLOGY)

SECTION-A

151.	(4)	158.	(4)	165.	(2)	172.	(2)	179.	(4)
152.	(4)	159.	(1)	166.	(2)	173.	(4)	180.	(3)
153.	(4)	160.	(2)	167.	(4)	174.	(1)	181.	(2)
154.	(3)	161.	(3)	168.	(4)	175.	(1)	182.	(4)
155.	(4)	162.	(2)	169.	(3)	176.	(1)	183.	(2)
156.	(3)	163.	(4)	170.	(4)	177.	(1)	184.	(3)
157.	(4)	164.	(2)	171.	(1)	178.	(2)	185.	(2)

SECTION-B

186.	(4)	189.	(4)	192.	(4)	195.	(2)	198.	(1)
187.	(2)	190.	(2)	193.	(1)	196.	(2)	199.	(2)
188.	(4)	191.	(2)	194.	(1)	197.	(3)	200.	(2)

Hints and Solution

(PHYSICS)

SECTION-A

1. (3)

As the ball is thrown with speed greater than the terminal speed, the sum of viscous force and buoyant force will be greater than weight. The ball will retard till its speed decreases to terminal speed.

(NEW NCERT 11th Page No. 190)

2. (2)

Sudden processes are considered adiabatic.

Using first law of thermodynamics

$\Delta Q = \Delta U + \Delta W$

$\Delta Q = 0$ for adiabatic process

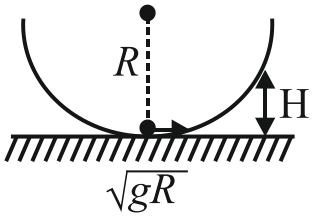
$\Delta W < 0$, due to compression

$\therefore\ \Delta U > 0$ or temperature will rise.

(NEW NCERT 11th Page No. 234)

3. (4)

Using conservation of mechanical energy



Loss in kinetic energy = gain in potential energy

$\frac{1}{2}m(gR) = mg\ \mathrm{H}$

$\mathrm{H} = \frac{R}{2}$

(NEW NCERT 11th Page No. 78)

4. (3)

$4v^2 = 25 - x^2$

$v^2 = \frac{1}{4}(25 - x^2)$

Taking square root

$v = \frac{1}{2}\sqrt{5^2 - x^2}$

Comparing with $v = \omega\sqrt{A^2 - x^2}$

$\omega = \frac{1}{2}$

$\omega = \frac{2\pi}{T} = \frac{1}{2}$

$T = 4\pi\,\mathrm{s}.$

(NEW NCERT 11th Page No. 266)

5. (3)

As temperature decreases rate of cooling decreases. Time taken will be more than 10 minutes.

(NEW NCERT 11th Page No. 219)

6. (4)

$Y_1 = a\sin(\omega t + kx + 0.57)$

$Y_2 = a\sin\left(\frac{\pi}{2} + \omega t + kx\right)$

Phase difference = $\frac{\pi}{2} - 0.57$

= 1 rad.

(NEW NCERT 11th Page No. 282)

7. (4)

$P = \rho(g + a)H$

As pressure inside elevator is 1 atm. To keep pressure same H will reduce.

Reading will be less than 76 cm.

(NEW NCERT 11th Page No. 182)

8. (2)

Let the Celsius reading be x, then the Fahrenheit reading will be $2x$.

So, $\frac{x-0}{100-0} = \frac{2x-32}{212-32}$

$\frac{x}{5} = \frac{2x-32}{9}$

$9x = 10x - 160$

$x = 160°\mathrm{C}$

(NEW NCERT 11th Page No. 203)

9. (2)

$V_P = -(\text{slope})V_{\text{wave}}$

As V_{wave} is – ve

$\therefore$ Wherever slope is positive particles are going up and vice versa.

Particles at D, E, F have downward velocity.

(NEW NCERT 11th Page No. 280)

10. (4)

The restoring torque is provided by a component of weight of the bob.

(NEW NCERT 11th Page No. 270)

11. (2)

$|f_A - f_B| = 6$ Hz

When tension in B increases f_B increases.

As the beats frequency is increasing

Therefore $f_B - f_A = 6$

$f_B = 6 + 530 = 536$ Hz

(NEW NCERT 11th Page No. 293)

12. (2)

$\Delta V = \Delta V_m - \Delta V_g$

$= 200\,[1.8 \times 10^{-4} - 1.2 \times 10^{-5}] \times 10$

$= 0.336\ \text{cm}^3$

(NEW NCERT 11th Page No. 206)

13. (2)

$\overrightarrow{V_A} = 10\cos 53^\circ \hat{i} + 10\sin 53^\circ \hat{j} = 6\hat{i} + 8\hat{j}$

$\overrightarrow{V_B} = 4\hat{i}$

$\vec{V}_{com} = \dfrac{2(6\hat{i} + 8\hat{j}) + 2(4\hat{i})}{4}$

$= \dfrac{12\hat{i} + 16\hat{j} + 8\hat{i}}{4} = \dfrac{20\hat{i} + 16\hat{j}}{4} = 5\hat{i} + 4\hat{j}$

$\left|\overrightarrow{V_{com}}\right| = \sqrt{25+16} = \sqrt{41}$ m/s.

(NEW NCERT 11th Page No. 99)

14. (2)

Let temperature at the junction is T

$3k(T-100) + k(T-20) + 2k(T-50) = 0$

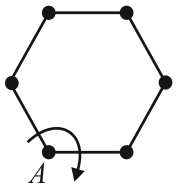
$\Rightarrow \quad 3T - 300 + T - 20 + 2T - 100 = 0$

$6T = 420$

$\Rightarrow \quad T = 70^\circ\text{C}$

(NEW NCERT 11th Page No. 214)

15. (2)



$I_A = 2ml^2 + 2m(3l^2) + m(2l)^2$

$= 8ml^2 + 4ml^2$

$= 12\ ml^2$

(NEW NCERT 11th Page No. 115)

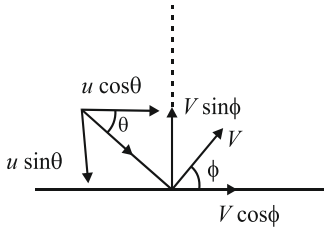
16. (1)

Increasing volume by 100% means the volume is doubled.

$W_{\text{iso}} = NRTln\dfrac{V_f}{V_i} = NRTln2$

(NEW NCERT 11th Page No. 234)

17. (2)



For inelastic oblique collision with the floor.

$e\,u\sin\theta = V\sin\phi$

$u\cos\theta = V\cos\phi$

$e\tan\theta = \tan\phi$

$e = \dfrac{\tan\phi}{\tan\theta} < 1$

$\therefore \quad \phi < \theta$

(NEW NCERT 11th Page No. 84)

18. (3)

For open organ pipe $f_0 = \dfrac{nv}{2L_0}$

For closed organ pipe $f_0 = \dfrac{(2n+1)v}{4L_C}$

Given $\dfrac{v}{2L_0} = \dfrac{3v}{4L_C} \quad \Rightarrow L_0 = \dfrac{2}{3}L_C$

$= 13.3$ cm

(NEW NCERT 11th Page No. 298)

19. (3)

As the speed is constant and radius of semicircle is constant the magnitude of centripetal force will be same.

(NEW NCERT 11th Page No. 63)

20. (1)

$V_{rms} \alpha \dfrac{1}{\sqrt{M}}$

$\dfrac{V_H}{V_0} = \sqrt{\dfrac{M_0}{M_H}} = \sqrt{\dfrac{32}{2}} = \dfrac{4}{1}$

(NEW NCERT 11th Page No. 244)

21. (1)

Area under the curve increases continuously.

(NEW NCERT 11th Page No. 210)

22. (4)

As force is maximum at S also area is minimum at S

$\therefore$ Stress is maximum at S

(NEW NCERT 11th Page No. 168)

23. (3)

$E \alpha T^4$

$\dfrac{E'}{E} = \left(\dfrac{1.10T}{T}\right)^4 = 1.46$

% change $\approx 46\%$

(NEW NCERT 11th Page No. 216)

24. (3)

The presence of a constant force does not effect the time period of a linear SHM.

(NEW NCERT 11th Page No. 267)

25. (4)

$$\frac{k_{eq}\,2A(\Delta T)}{L}=\frac{3kA(\Delta T)}{L}+\frac{5kA(\Delta T)}{L}$$

$\Rightarrow 2k_{eq} = 8k$

$keq = 4k$

(NEW NCERT 11th Page No. 215)

26. (2)

$$E \propto T^4$$

$$\frac{E}{E_2}=\left(\frac{280}{350}\right)^4$$

$$E_2=\left(\frac{5}{4}\right)^4 E=\frac{625E}{256}$$

(NEW NCERT 11th Page No. 217)

27. (3)

$$a=-a_0\sin\omega t=-\omega^2 x$$

$$x=\frac{a_0}{\omega^2}\sin\omega t$$

(NEW NCERT 11th Page No. 268)

28. (3)

At constant volume $W = 0$

$$\Delta Q=\Delta U$$

All energy goes in form of internal energy.

(NEW NCERT 11th Page No. 230)

29. (1)

Frequency remains same

$$\frac{V_1}{\lambda_1}=\frac{V_2}{\lambda_2}$$

$$\frac{\lambda_2}{\lambda_1}=\frac{V_2}{V_1}=\sqrt{\frac{m_1+m_2}{m_2}}$$

(NEW NCERT 11th Page No. 284)

30. (1)

The difference in two consecutive resonant frequencies of an open organ pipe is equal to its fundamental frequency.

(NEW NCERT 11th Page No. 293)

31. (2)

Let final temperature is 100°C water

Heat lost by steam $5 \times 540 = 2700$ cal

Heat gained by ice

$= 6 \times 80 + 6 \times 100 = 600 + 480$

$= 1080$ cal $<<$ 2700 cal

Thus final temperature is 100°C

(NEW NCERT 11th Page No. 210)

32. (2)

$$v=\omega\sqrt{A^2-X^2}$$

$$\frac{v^2}{\omega^2}+X^2=A^2$$

$$\Rightarrow \frac{v^2}{(\omega A)^2}+\frac{X^2}{A^2}=1$$

Represent ellipse.

(NEW NCERT 11th Page No. 266)

33. (2)

$$y=y_0\sin\left(\frac{2\pi vt}{\lambda}-\frac{2\pi x}{\lambda}\right)$$

Wave velocity = v

Particle velocity

$$=\left(\frac{\partial y}{\partial t}\right)_x=y_0\cos\left(\frac{2\pi vt}{\lambda}-\frac{2\pi x}{\lambda}\right)\left(\frac{2\pi v}{\lambda}\right)$$

$$\left[\left(\frac{\partial y}{\partial t}\right)_x\right]_{\max}=\frac{2\pi v}{\lambda}y_0$$

If $V_P = 3V_W$

$$\frac{2\pi v y_0}{\lambda}=3v$$

$$\lambda=\frac{2\pi y_0}{3}$$

(NEW NCERT 11th Page No. 282)

34. (2)

$$U=\frac{A}{r^6}-\frac{B}{r^3}$$

$$F=\frac{-dU}{dx}=A\left[\frac{-6}{r^7}-\frac{B(-3)}{r^4}\right]=0$$

$$\Rightarrow \frac{6A}{r^7}=\frac{3B}{r^4}$$

$$\Rightarrow \frac{1}{r^3}=\frac{B}{2A}$$

$$U=\frac{A}{4A^2}(B^2)-B\left(\frac{B}{2A}\right)$$

$$=\frac{B^2}{4A}-\frac{B^2}{2A}=\frac{-B^2}{4A}$$

(NEW NCERT 11th Page No. 77)

35. (2)

On cutting each part has spring constant $4K$

$$T\alpha\frac{1}{\sqrt{K}}\Rightarrow T'=\frac{T}{2}$$

(NEW NCERT 11th Page No. 261)

SECTION-B

36. (1)

$$T_M = 2\pi\sqrt{\frac{\ell}{g_M}}$$

$$T_E = 2\pi\sqrt{\frac{\ell}{g_E}}$$

$$\frac{T_E}{T_M} = \sqrt{\frac{g_M}{g_E}} = \frac{1}{\sqrt{6}}$$

$$T_E = \frac{1}{\sqrt{6}} T_M$$

(NEW NCERT 11th Page No. 270)

37. (1)

$$v = \sqrt{\frac{T}{\mu}} = \sqrt{\frac{77 \times 5.5}{3.5 \times 10^{-2}}} = 110 \text{ m/s}$$

(NEW NCERT 11th Page No. 284)

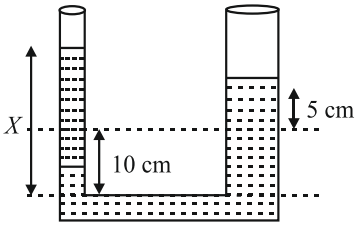
38. (2)

$F = YA\alpha\Delta T$

$= 10^{11} \times 10^{-3} \times 10^{-6} \times 20 = 2000$ N

(NEW NCERT 11th Page No. 168)

39. (3)



$\rho_0 g(x) = \rho_w g(15)$

$0.8(x) = 1(15)$

$x = 18.75$ cm

Difference in levels = 18.75 – 15 = 3.75 cm

(NEW NCERT 11th Page No. 183)

40. (4)

For beats the two sources must have small difference in frequencies.

(NEW NCERT 11th Page No. 295)

41. (4)

Slope adiabatic = γ × slope isothermal

$$\text{Slope} = \frac{4}{3} \times \frac{3}{4} = 1$$

Angle with $-V$ axis is 45°.

(NEW NCERT 11th Page No. 229)

42. (2)

$$Y = \frac{\frac{F}{A}}{\frac{\Delta\ell}{\ell}} \Rightarrow \Delta\ell = \frac{F\ell}{AY} = \frac{F\ell}{\pi r^2 Y}$$

$$\frac{\Delta\ell_1}{\Delta\ell_2} = \frac{4F\ell_1}{\pi d_1^2 Y} \times \frac{\pi d_2^2 Y}{4F\ell_2}$$

$$= \frac{\ell_1}{\ell_2} \times \frac{d_2^2}{d_1^2} = \frac{1}{2} \times \frac{1}{(2)^2} = \frac{1}{8}$$

(NEW NCERT 11th Page No. 170)

43. (3)

$K = \frac{L^2}{2I}$, given $K_A = K_B$

$$\Rightarrow \frac{L_A^2}{2I_A} = \frac{L_B^2}{2I_B}$$

$$\Rightarrow \frac{L_A}{L_B} = \sqrt{\frac{I_A}{I_B}} < 1$$

$L_A < L_B$

(NEW NCERT 11th Page No. 120)

44. (2)

Potential energy and kinetic energy oscillates with frequency $2n$.

(NEW NCERT 11th Page No. 269)

45. (2)

$$\text{Retardation} = \frac{F_{net}}{m} = \frac{F_B - mg}{m}$$

$$\frac{a = \frac{\rho_\ell}{\rho_s} mg - mg}{m}$$

$$a = \left(\frac{\sigma}{\rho} - 1\right) g$$

$$t = \frac{2v}{a}$$

$$t = \frac{2v}{\left(\frac{\sigma}{\rho} - 1\right) g}$$

$$= \frac{2v\rho}{(\sigma - \rho) g}$$

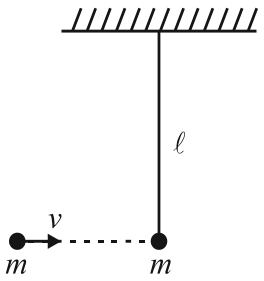
(NEW NCERT 11th Page No. 185)

46. (1)

$F_v \propto vr$

(NEW NCERT 11th Page No. 190)

47. (2)



After collision speed of combined mass $=\frac{v}{2}$, using conservation of linear momentum.

$\frac{v}{2}=\sqrt{5g\ell}$

$v=2\sqrt{5g\ell}$

(NEW NCERT 11th Page No. 79)

48. (1)

$$X_{com}=\frac{M_1X_1+M_2X_2+M_3X_3}{M_1+M_2+M_3}$$

$M_1=M$, $X_1=0$

$$M_2=\frac{-M}{\pi R^2}\times\frac{\pi R^2}{16}=\frac{-M}{16},\ X_2=\frac{3R}{4}$$

$$M_3=\frac{-M}{\pi R^2}\times\frac{\pi R^2}{16}=\frac{-M}{16},\ X_3=\frac{-R}{2}$$

$$X_{com}=\frac{\frac{-M}{16}\times\frac{3R}{4}+\frac{M}{16}\times\frac{R}{2}}{M-\frac{M}{8}}=\frac{\frac{MR}{32}-\frac{3MR}{64}}{\frac{7M}{8}}$$

$$=\frac{\frac{-MR}{64}}{\frac{7M}{8}}=\frac{-R}{56}$$

(NEW NCERT 11th Page No. 95)

49. (2)

Angular Impulse = change in angular momentum

$(T)(t) = I\omega$

$$T=\frac{I\omega}{t}=\frac{24\times2\pi\times720}{\pi\times60\times8}$$

$$=\frac{48\times720}{60\times8}=72\ \text{Nm}$$

(NEW NCERT 11th Page No. 118)

50. (1)

$W=\Delta U=T(\Delta A)$

$=2T[4\pi(4R^2)-4\pi(R^2)]$

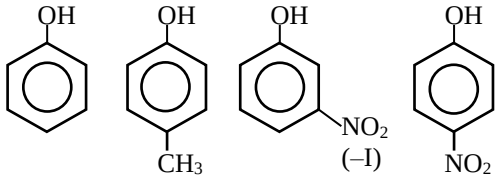
$=8\pi T[3R^2]=24\pi R^2T$

(NEW NCERT 11th Page No. 192)

(CHEMISTRY)

SECTION-A

51. (4)

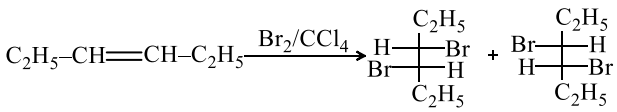


(I) (II) (III) (IV)

Order will be: (IV) > (III) > (I) > (II)

(NCERT Part-II Class-XIth Page No. 346)

52. (4)



(NCERT Part-II Class-XIth Page No. 388)

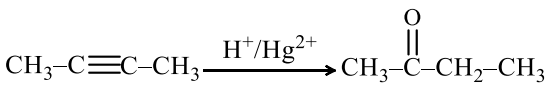
53. (4)

In option (4), hydrogen atom shift is observed which is not possible in resonance.

(NCERT Part-II Class-XIth Page No. 346)

54. (3)

Symmetrical alkyne on hydration will give only one ketone.



(NCERT Part-II Class-XIth Page No. 395)

55. (1)

$K_P = K_C\,[RT]^{\Delta n}$, $\Delta n = 2 - 4 = -2$

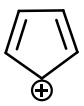
T = 673K, K_C = 0.8, R = 0.082 L atm $K^{-1}mol^1$

$K_P = 0.8 \times (0.082 \times 673)^{-2}$

$= 2.624 \times 10^{-4}$

(NCERT Part-I Class-XIth Page No. 195)

56. (2)

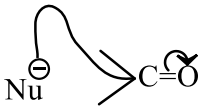


The above species contains 4π e^-s, hence it is not following Huckel's rule and it is plannar. So it is antiaromatic.

(NCERT Part-II Class-XIth Page No. 396)

57. (3)

Electromeric effect is shifting of electron of multiple bond under the influence of a attacking reagent.



(NCERT Part -II Class-XIth Page No. 347)

58. (3)

In MCl element M has valance +1.

So, formula of its phosphate will be M_3PO_4.

(NCERT Part-I Class-XIth Page No. 17)

59. (4)

Statement I and II both are wrong as resonance is delocalisation of π e^- s whereas hyperconjugation is delocalisation of σ e^- s.

(NCERT Part-II Class-XIth Page No. 346)

60. (4)

Fluorine exist only in –1 oxidation state as it is most electronegative element in periodic table, as its electronic configuration is $1s^2 2s^2 2p^5$.

(NCERT Part-I Class-XIth Page No. 259)

61. (2)

All the given compounds are basic due to the presence of lone pair on nitrogen. In (2) the lone pair are involved in aromaticity. Hence unavailable for donation making it least basic.

(NCERT Part-II Class-XIth Page No. 346)

62. (3)

As number of alpha hydrogen increases, stability of carbocation increases due to hyperconjugation.

(NCERT Part-II Class-XIth Page No. 348)

63. (1)

We have

$$pH = -\log K_a + \log \frac{[Salt]}{[Acid]}$$

$$= -\log (3 \times 10^{-5}) + \log \frac{\frac{0.4 \times 1000}{100}}{\frac{0.1 \times 1000}{100}}$$

$$= 4.5 + 0.6 = 5.1$$

(NCERT Part-I Class-XIth Page No. 219)

64. (1)

$$CH_3COO^-Na^+ + NaOH \xrightarrow[\Delta]{CaO} CH_4 + Na_2CO_3$$

(NCERT Part-II Class-XIth Page No. 379)

65. (3)

Primary carbocation are difficult to form as compared to tertiary carbocation as no effect operates on it for stability enhancement.

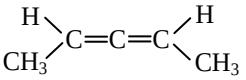
(NCERT Part-II Class-XIth Page No. 347)

66. (2)

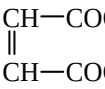
For l = 0, m can have value only 0.

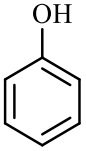
(NCERT Part-I Class-XIth Page No. 55)

67. (1)

 optically active

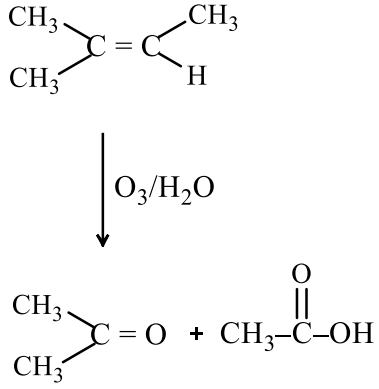
$HCOOC_2H_5$ shows metamerism

 Shows geometrical isomerism

 Shows tautomerism

(NCERT Part-II Class-XIth Page No. 387)

68. (4)



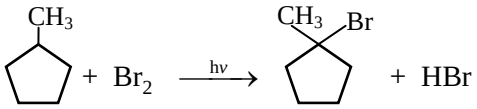
(NCERT Part-II Class-XIth Page No. 390)

69. (2)

No. of radial nodes = No. of times graph touches x – axis.

(NCERT Part-I Class-XIth Page No. 57)

70. (4)



(NCERT Part-II Class-XIth Page No. 380)

71. (3)

For basic buffer

$$pOH = pK_b + \log \frac{[salt]}{[base]}$$

$$pH + pOH = 14$$

$$\text{Hence } pH = 14 - pK_b - \log \frac{[salt]}{[base]}$$

(NCERT Part-I Class-XIth Page No. 218)

72. **(1)**

$CH_3CH=CH_2$

$\downarrow Cl_2, 500^oC$

$Cl–CH_2CH=CH_2$

(NCERT Part-II Class-XIth Page No. 380)

73. **(4)**

Phenol & Alcohol are functional group isomers.

(NCERT Part-II Class-XIth Page No. 390)

74. **(3)**

Reduction

$\overset{0}{Cl_2} \xrightarrow{+2e^-} 2Cl^-$

Oxidation

$Na^0 \xrightarrow{-e^-} Na^+$

Disproportionation

$Br_2 \rightarrow Br^- + BrO_3^-$

Redox

$4Na + O_2 \rightarrow 2Na_2O$

(NCERT Part-II Class-XIth Page No. 262)

75. **(3)**

$N_2 + 3H_2 \rightleftharpoons 2NH_3$; K

$NH_3 \rightleftharpoons \frac{1}{2}N_2 + \frac{3}{2}H_2$; K'

New reaction = reverse of old reaction $\times \frac{1}{2}$

$K' = \frac{1}{\sqrt{K}} = \frac{1}{\sqrt{25}} = \frac{1}{5} = 0.2$

(NCERT Part-I Class-XIth Page No. 193)

76. **(2)**

Lesser the value of K, less will be the tendency to show forward reaction making oxide stable.

(NCERT Part-I Class-XIth Page No. 193)

77. **(2)**

Peroxide effect is noticed only in case of HBr. For HCl will follow Markovnikv's rule even in the presence of peroxide.

$CH_3CH=CH_2+HCl \rightarrow CH_3CHClCH_3$

(NCERT Part-II Class-XIth Page No. 389)

78. **(3)**

The correct IUPAC is;

Propane-1,2,3-tricarbonitrile.

(NCERT Part-II Class-XIth Page No. 337)

79. **(4)**

$\Delta H < 0$, $\Delta S > 0$ for spontaneous reaction.

(NCERT Part-I Class-XIth Page No. 175)

80. **(3)**

I. $CH_3-\overset{\oplus}{C}H-CH_3$ (+I, +H)

II. $CH_3-\overset{\oplus}{C}H-\ddot{O}CH_3$ (+R, +I)

III. $CH_3-\overset{\oplus}{C}H-\overset{O}{\overset{\|}{C}}-CH_3$ (–I)

Hence order is II > I > III.

(NCERT Part-II Class-XIth Page No. 346)

81. **(4)**

$N_2O_5 \rightarrow +5$

$HNO_2 \rightarrow +3$

$HN_3 \rightarrow -\frac{1}{3}$

$NH_3 \rightarrow -3$

(NCERT Part-II Class-XIth Page No. 259)

82. **(2)**

$pH = -\log_{10}[H^+]$

The concentration of H^+ ions is expressed in gm equivalent

Molarity of $H_3PO_4 = 0.033$

$\therefore$ Normality $= 0.033 \times 3 = 0.099 = 0.1$

$\therefore$ $pH = -\log [0.1]$

or $pH = \mathbf{1}$

(NCERT Part-I Class-XIth Page No. 210)

83. **(4)**

No geometrical isomerism can be shown by Butane dioic acid as there is no double bond or ring.

(NCERT Part-II Class-XIth Page No. 387)

84. **(3)**

$CH_4(g)+2O_2(g) \longrightarrow CO_2(g)+2H_2O(l)$

$\Delta H = \Delta U + \Delta n_g RT$

$\Delta H = \Delta U - 2n_g RT$

$\Delta U > \Delta H$, $\Delta n_g = -2$

(NCERT Part-I Class-XIth Page No. 161)

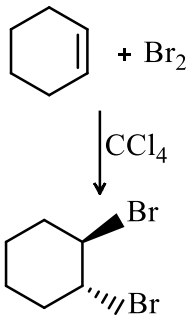
85. **(3)**

P,V,T are state functions they are independent of the path followed.

(NCERT Part-I Class-XIth Page No. 156)

SECTION-B

86. (2)



anti addition

(NCERT Part-II Class-XIth Page No. 388)

87. (1)

$-NO_2$ is electron withdrawing group hence it will increase acidity and decrease pK_a of an acid.

(NCERT Part-II Class-XIth Page No. 340)

88. (3)

16g O_2 contains N_A atoms and 16g of O_3 contains N_A atoms, hence number of atoms are equal

Each of these species represents different moles.

(NCERT Part-I Class-XIth Page No. 17)

89. (2)

No of moles of $H_2SO_4 = \frac{4.9}{98}$

$= \frac{1}{20}$

No of atom in $H_2SO_4 = 7$

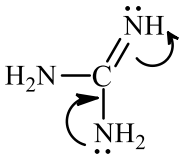
No of atom in $\frac{1}{20}$ moles $H_2SO_4 = \frac{7}{20}$

= 0.35 moles

(NCERT Part-I Class-XIth Page No. 17)

90. (2)

Most basic compound



Due to extra lone pair for donation.

(NCERT Part-II Class-XIth Page No. 346)

91. (1)

No of radial nodes = No. of times graph touches x–axis.

	radial nodes
2s	1
3s	2
1s	0
2p	0

(NCERT Part-I Class-XIth Page No. 57)

92. (3)

$K_p = \frac{K_{forward}}{K_{backward}} = \frac{(P_{Product})^1}{(P_{Reactant})^2}$;

Unit of $K_p = atm^{-1}$

(NCERT Part-I Class-XIth Page No. 193)

93. (4)

25 ml $\frac{M}{5}$ NaOH will neutralise 25 ml $\frac{M}{5}$ HCl. Hence, 50 ml $\frac{M}{5}$ NaOH get rest and the mixing of both solution will give total 100 ml volume.

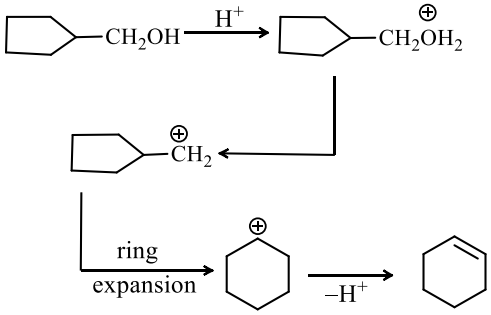
$N_1V_1 = N_2V_2$ ($N = M$, $\because n_f = 1$)

$50 \times \frac{N}{5} = N_2 \times 100$

$N_2 = \frac{50 \times N}{5 \times 100} = 0.1$ Hence, pOH = 1

(NCERT Part-I Class-XIth Page No. 218)

94. (3)



(NCERT Part-II Class-XIth Page No. 389)

95. (2)

Stronger the acid weaker is its conjugated base.

Acidity order

$H_2O < CH_3COOH < HCl$

Basicity order

$OH^- > CH_3COO^- > Cl^-$

(NCERT Part-II Class-XIth Page No. 207)

96. (3)

More the number of α-H more will be hyperconjugation.

(NCERT Part-II Class-XIth Page No. 346)

97. (1)

In 0.01M $AgNO_3$

$AgNO_3 \rightleftharpoons Ag^+ + NO_3^-$

$AgCl \rightleftharpoons Ag^+ + Cl^-$

$K_{sp} = [Ag^+][Cl^-]$

Now, $[Ag^+]$ can be taken as $[AgNO_3]$ while $[Cl^-]$ is the solubility of AgCl

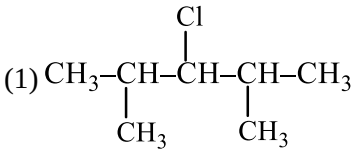
$Cl^- = \frac{K_{sp}}{[Ag^+]} = \frac{5.8 \times 10^{-10}}{0.01}$

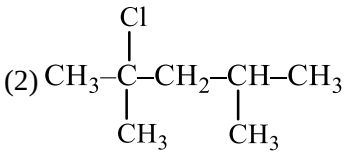
Solubility of AgCl

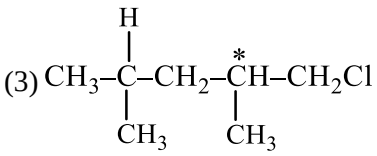
$= 5.8 \times 10^{-8}$ mol/litre

(NCERT Part-I Class-XIth Page No. 220)

98. (3)

(1) 

(2) 

(3) 

(NCERT Part-II Class-XIth Page No. 380)

99. (3)

At low pressure reaction move in that direction where more number of gaseous moles are present which is present only in (3) reaction.

(NCERT Part-I Class-XIth Page No. 202)

100. (1)

$$\underset{1-X}{NH_3} + H_2O \rightleftharpoons \underset{X}{NH_4^+} + \underset{X}{OH^-}$$

$$K_b = \frac{[NH_4^+][OH^-]}{[NH_3]} = \frac{X^2}{(1-X)} = X^2$$

$(\because 1 - X \approx 1)$

$$\therefore X = [OH^-] = \sqrt{K_b} = \sqrt{1.8\times10^{-5}} = 4.24 \times 10^{-3}\ M$$

(NCERT Part-I Class-XIth Page No. 218)

(BOTANY)

SECTION-A

101. (3)

A special membranous structure is the mesosome which is formed by the extensions of plasma membrane into the cell. These extensions are in the form of vesicles, tubules and lamellae. They help in cell wall formation, DNA replication and distribution to daughter cells. They also help in respiration, secretion processes, to increase the surface area of the plasma membrane and enzymatic content.

(NEW NCERT 11th Page No. 90)

102. (1)

Mammalia is a class. *Mangifera* and *indica* are generic and specific names of mango, respectively. Systematics is a branch of study that takes into account evolutionary relationships between organisms.

(NEW NCERT 11th Page No. 4)

103. (3)

The Mycoplasma are organisms that completely lack a cell wall. They are the smallest living cells known and can survive without oxygen. Many types of Mycoplasma are pathogenic in animals and plants.

(NEW NCERT 11th Page No. 14)

104. (2)

Leaves of dicotyledonous plants generally possess reticulate venation and are dorsiventral, while parallel venation is the characteristic of most monocotyledons (isobilateral leaf).

(NEW NCERT 11th Page No. 60)

105. (3)

In bryophytes, zygotes do not undergo reduction division immediately. They produce a multicellular body called a sporophyte. The sporophyte is not free-living but attached to the photosynthetic gametophyte and derives nourishment from it. Some cells of the sporophyte undergo reduction division (meiosis) to produce haploid spores. These spores germinate to produce gametophyte.

(NEW NCERT 11th Page No. 29)

106. (1)

Pith is large and well developed in monocot root and dicot stem. When xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii, the arrangement is called radial such as in roots.

(NEW NCERT 11th Page No. 74 and 76)

107. (3)

Anaphase I: The homologous chromosomes separate, while sister chromatids remain associated at their centromeres.

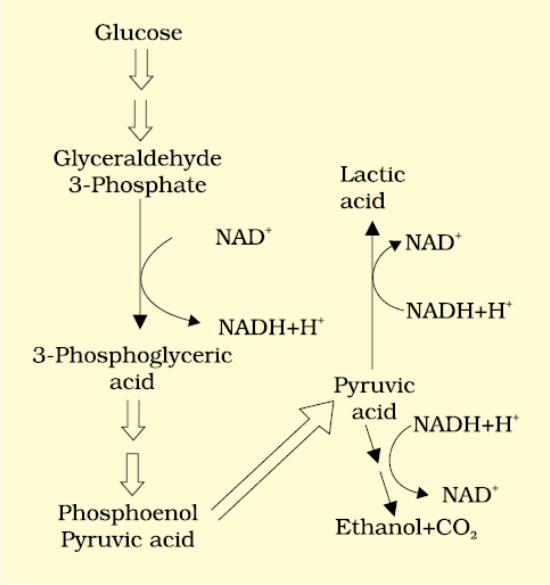
Metaphase II: At this stage the chromosomes align at the equator and the microtubules from opposite poles of the spindle get attached to the kinetochores of sister chromatids. Only one metaphasic plate is present in metaphase II and two plates and metaphase I.

Anaphase II: It begins with the simultaneous splitting of the centromere of each chromosome (which was holding the sister chromatids together), allowing them to move toward opposite poles of the cell by shortening of microtubules attached to kinetochores.

Telophase II: Meiosis ends with telophase II, in which the two groups of chromosomes once again get enclosed by a nuclear envelope; cytokinesis follows resulting in the formation of tetrad of cells i.e., four haploid daughter cells.

(NEW NCERT 11th Page No. 127)

108. (2)



(NEW NCERT 11th Page No. 157)

109. (2)

There is a clear division of labour within the chloroplast. The membrane system is responsible for trapping the light energy and also for the synthesis of ATP and NADPH. In stroma, enzymatic reactions synthesise sugar, which in turn forms starch. The former set of reactions, since they are directly light driven are called light reactions (photochemical reactions). The latter are not directly light driven but are dependent on the products of light reactions (ATP and NADPH). Hence, to distinguish the latter they are called, by convention, as dark reactions (carbon reactions).

(NEW NCERT 11th Page No. 136)

110. (3)

Fusion of protoplasm between two motile or non-motile gametes is called plasmogamy.

(NEW NCERT 11th Page No. 17)

111. (3)

In some plants, like grasses, *Monstera* and the banyan tree, roots arise from parts of the plant other than the radicle and are called adventitious roots.

(NEW NCERT 11th Page No. 58)

112. (1)

The action spectrum of photosynthesis is the complete visible light or VIBGYOR spectrum whereas, absorption maxima of chlorophyll a is at blue light and red light.

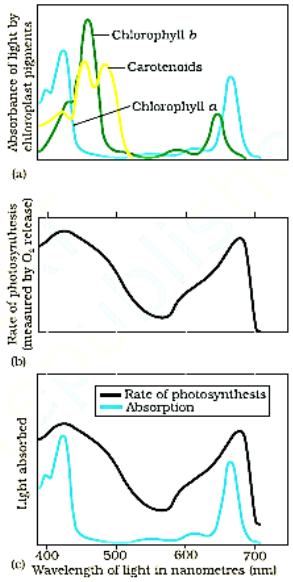


Figure 11.3a Graph showing the absorption spectrum of chlorophyll *a*, *b* and the carotenoids
Figure 11.3b Graph showing action spectrum of photosynthesis
Figure 11.3c Graph showing action spectrum of photosynthesis superimposed on absorption spectrum of chlorophyll *a*

(NEW NCERT 11th Page No. 137)

113. (3)

In C_3 plants Calvin cycle takes place in mesophyll cells and in C_4 plants, it occurs in bundle sheath cells.

(NEW NCERT 11th Page No. 145)

114. (1)

RuBisCO has a much greater affinity for CO_2 when the CO_2: O_2 is nearly equal.

(NEW NCERT 11th Page No. 147)

115. (2)

It is possible to make calculations of the net gain of ATP for every glucose molecule oxidized. But in reality, this can remain only a theoretical exercise. These calculations can be made only on certain assumptions that:

- There is a sequential, orderly pathway functioning, with one substrate forming the next and with glycolysis, TCA cycle and ETS pathway following one after another.
- The NADH + H^+ synthesised in glycolysis is transferred into the mitochondria and undergoes oxidative phosphorylation.
- None of the intermediates in the pathway are utilised to synthesise any other compound.
- Only glucose is being respired – no other alternative substrates are entering in the pathway at any of the intermediary stages.

(NEW NCERT 11th Page No. 161)

116. (2)

In C_4 plants, the primary CO_2 acceptor is a 3-carbon molecule phosphoenol pyruvate (PEP) and is present in the mesophyll cells. The enzyme responsible for this fixation is PEP carboxylase or PEPcase.

(NEW NCERT 11th Page No. 146)

117. (2)

The TCA cycle or Krebs' cycle starts with the condensation of acetyl Co-A with oxaloacetic acid (OAA) and water to yield citric acid.

(NEW NCERT 11th Page No. 158)

118. (2)

In plant cells, wall formation starts in the centre of the cell and grows outward to meet the existing lateral walls. The formation of the new cell wall begins with the formation of a simple precursor, called the cell-plate that represents the middle lamella between the walls of two adjacent cells.

(NEW NCERT 11th Page No. 124)

119. (3)

Succinate dehydrogenase is the only enzyme of TCA cycle which is located in the inner mitochondrial membrane and the rest are located in the mitochondrial matrix. Refer Figure 12.4.

(NEW NCERT 11th Page No. 160)

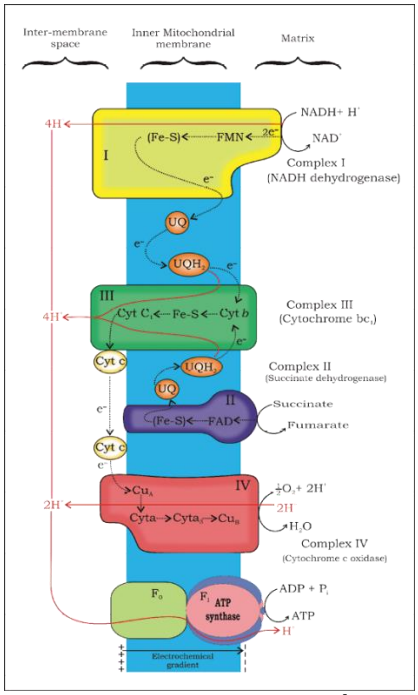
120. (1)

Krebs' cycle occurs in mitochondrial matrix and the products of ETS are ATP and O_2.

(NEW NCERT 11th Page No. 159, 160, 161)

121. (1)

The terminal oxygen acceptor of the ETS is oxygen that reduces to form water molecule.



(NEW NCERT 11th Page No. 160)

122. (1)

Joseph Priestley (1733-1804) in 1770 performed a series of experiments that revealed the essential role of air in the growth of green plants. Priestley observed that a candle burning in a closed space – a bell jar, soon gets extinguished. Similarly, a mouse would soon suffocate in a closed space. He concluded that a burning candle or an animal that breathe the air, both somehow, damage the air. But when he placed a mint plant in the same bell jar, he found that the mouse stayed alive and the candle continued to burn. Priestley hypothesised as follows: Plants restore to the air whatever breathing animals and burning candles remove.

(NEW NCERT 11th Page No. 134)

123. (1)

When only PS I is functional, the electron is circulated within the photosystem and the phosphorylation occurs due to cyclic flow of electrons. A possible location where this could be happening is in the stroma lamellae. While the membrane or lamellae of the grana have both PS I and PS II the stroma lamellae membranes lack PS II as well as NADP reductase enzyme.

(NEW NCERT 11th Page No. 140)

124. (3)

The water splitting complex is associated with the PS II, which itself is physically located on the inner side of the membrane of the thylakoid.

(NEW NCERT 11th Page No. 139)

125. (2)

Carboxylation is the most crucial step of the Calvin cycle where CO_2 is utilised for the carboxylation of RuBP.

(NEW NCERT 11th Page No. 143)

126. (2)

The biosynthetic phase of photosynthesis does not directly depend on the presence of light but is dependent on the products of the light reaction, i.e., ATP and NADPH, besides CO_2 and H_2O. Immediately after light becomes unavailable, the biosynthetic process continues for some time, and then stops.

(NEW NCERT 11th Page No. 142)

127. (3)

Synthesis of one glucose molecule by Calvin cycle requires the following:

In	Out
Six CO_2	One glucose
18 ATP	18 ADP
12 NADPH	12 NADP

Therefore, for the production of one molecule of sucrose (equivalent to two molecules of glucose), 36 ATP and 24 NADPH will be required.

(NEW NCERT 11th Page No. 145)

128. (3)

In C_3 plants some O_2does bind to RuBisCO, and hence CO_2 fixation is decreased. Here, the RuBP instead of being converted to 2 molecules of PGA binds with O_2 to form one molecule of phosphoglycerate (3-C) and phosphoglycolate (2-C) in a pathway called photorespiration.

(NEW NCERT 11th Page No. 147)

129. (2)

Animals are heterotrophic, i.e., they obtain food from plants directly (herbivores) or indirectly (carnivores). Saprophytes like fungi are dependent on dead and decaying matter. In green plants too, not all cells, tissues and organs photosynthesise; only cells containing chloroplasts, that are most often located in the superficial layers, carry out photosynthesis. Hence, even in green plants all other organs, tissues and cells that are non-green, need food for oxidation. The breaking of the C-C bonds of complex compounds through oxidation within the cells, leading to release of considerable amount of energy is called respiration. Usually carbohydrates are oxidised to release energy, but proteins, fats and even organic acids can be used as respiratory substances in some plants, under certain conditions.

(NEW NCERT 11th Page No. 153, 154)

130. (1)

Product of EMP pathway (glycolysis) = ATP, NADH + H^+ and Pyruvate.

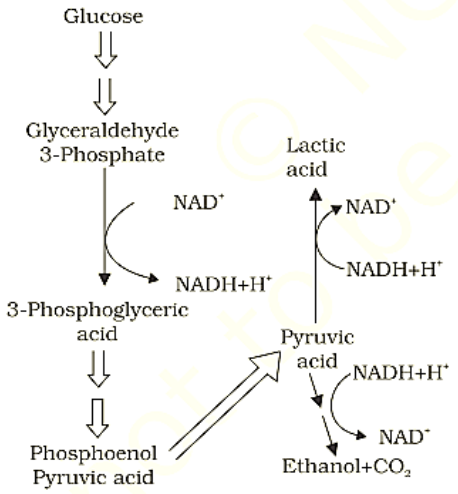
First product of Hatch and Slack pathway = OAA.

First stable product of Calvin cycle = 3 PGA.

(NEW NCERT 11th Page No. 143, 146, 156)

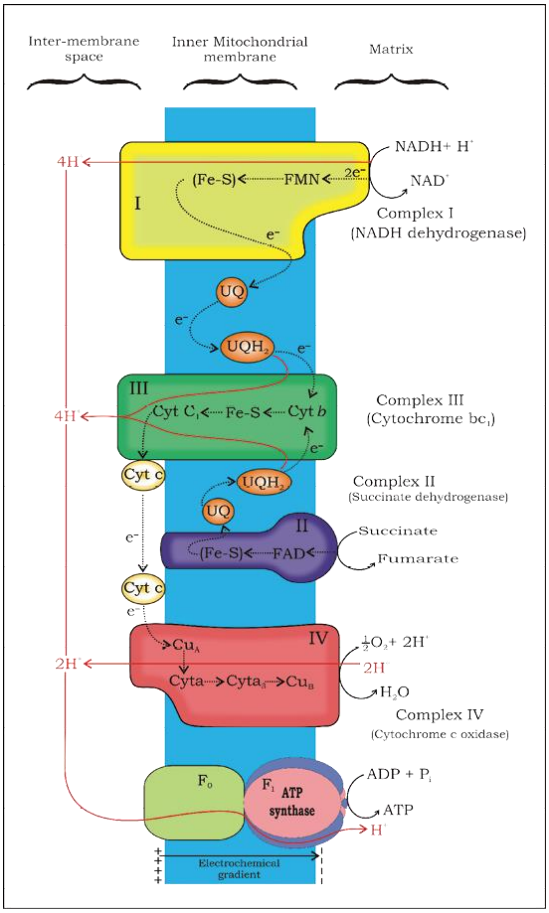
131. (3)

Both pyruvate and lactate are 3 carbon compounds. In lactic acid fermentation, pyruvate is converted to lactate without the loss of carbon in the form of CO_2.



(NEW NCERT 11th Page No. 157)

132. (2)



(NEW NCERT 11th Page No. 160)

133. (4)

When fats are used in respiration, the RQ is less than 1. For tripalmitin it is 0.7. When proteins are respiratory substrates the ratio would be about 0.9 and for organic acids it will be about 4. For sugars like glucose, the RQ is 1.

(NEW NCERT 11th Page No. 164)

134. (1)

$$\text{Pyruvic acid} + \text{CoA} + NAD^+ \xrightarrow[\text{Pyruvate dehydrogenase}]{Mg^{2+}} \text{Acetyl CoA} + CO_2 + NADH + H^+$$

(NEW NCERT 11th Page No. 158)

135. (1)

The temperature optimum for photosynthesis of different plants also depends on the habitat that they are adapted to. Tropical plants have a higher temperature optimum than the plants adapted to temperate climates.

(NEW NCERT 11th Page No. 150)

SECTION-B

136. (1)

Plant cell and animal cell have some differences such as presence of plastid and large vacuole in plant cells.

(NEW NCERT 11th Page No. 91)

137. (3)

The suffixes used in taxonomical hierarchy of plants are as follows:

Order: -ales

Class: -onae

Family: -aceae

(NEW NCERT 11th Page No. 7)

138. (1)

There is a clear division of labour within the chloroplast. The membrane system is responsible for trapping the light energy and also for the synthesis of ATP and NADPH + H^+. In stroma, enzymatic reactions synthesise sugar, which in turn forms starch. The former set of reactions, since they are directly light driven are called light reactions or photochemical reactions.

(NEW NCERT 11th Page No. 136)

139. (1)

The gymnosperms are heterosporous. They produce haploid microspores and megaspores. The two kinds of spores are produced within sporangia that are borne on sporophylls which are arranged spirally along an axis to form lax or compact strobili or cones. The strobili bearing microsporophylls and microsporangia are called microsporangiate or male strobili. The microspores develop into a male gametophytic generation which is highly reduced and is confined to only a limited number of cells. This reduced gametophyte is called a pollen grain. The development of pollen grains take place within the microsporangia. The cones bearing megasporophylls with ovules or megasporangia are called macrosporangiate or female strobili.

(NEW NCERT 11th Page No. 33)

140. (1)

Complex I	NADH dehydrogenase
Complex II	Succinate dehydrogenase
Complex III	Cytochrome bc_1
Complex IV	Cytochrome c oxidase

(NEW NCERT 11th Page No. 160)

141. (1)

Cytochrome c is a small mobile protein attached to the outer surface of the inner mitochondrial membrane. It links the complex III with complex IV. F_0 is an integral membrane protein complex of ATP synthase that forms the channel through which protons cross the inner membrane. It helps to restore back the proton gradient.

(NEW NCERT 11th Page No. 160)

142. (4)

The interphase is divided into three further phases:

- G_1 phase (Gap 1)
- S phase (Synthesis)
- G_2 phase (Gap 2)

Interphase is followed by M phase.

(NEW NCERT 11th Page No. 121)

143. (1)

Electrons in the reaction centre of PS I are excited when they receive red light of wavelength 700 nm and are transferred to another accepter molecule that has a greater redox potential. These electrons then are moved downhill, to a molecule of energy-rich $NADP^+$. The addition of these electrons reduces $NADP^+$ to NADPH + H^+.

(NEW NCERT 11th Page No. 139)

144. (4)

Monocot plant parts and dicot leaves do not show secondary growth.

(NEW NCERT 11th Page No. 74)

145. (3)

A chromatographic separation of the leaf pigments shows that the colour that we see in leaves is not due to a single pigment but due to four pigments: Chlorophyll *a* (bright or blue green in the chromatogram), chlorophyll *b* (yellow green), xanthophylls (yellow) and carotenoids (yellow to yellow-orange).

(NEW NCERT 11th Page No. 137)

146. (2)

The C_3 and C_4 plants respond differently to CO_2 concentrations. At low light conditions neither group responds to high CO_2 conditions. At high light intensities, both C_3 and C_4 plants show increase in the rates of photosynthesis. What is important to note is that the C_4 plants show saturation at about 360 $\mu l L^{-1}$ while C_3 responds to increased CO_2 concentration and saturation is seen only beyond 450 $\mu l L^{-1}$. Thus, current availability of CO_2 levels is limiting to the C_3 plants.

(NEW NCERT 11th Page No. 150)

147. (4)

In PS I the reaction centre chlorophyll *a* has an absorption peak at 700 nm, hence is called P700, while in PS II it has absorption maxima at 680 nm, and is called P680.

(NEW NCERT 11th Page No. 138)

148. (3)

The scheme of glycolysis was given by Gustav Embden, Otto Meyerhof, and J. Parnas, and is often referred to as the EMP pathway.

(NEW NCERT 11th Page No. 155)

149. (3)

One molecule of $NADH + H^+$ and $FADH_2$ produces 3 and 2 ATP respectively through ETS.

(NEW NCERT 11th Page No. 161)

150. (2)

The activity of ATP synthase produces and not utilises ATP.

(NEW NCERT 11th Page No. 161)

(ZOOLOGY)

SECTION-A

151. (4)

Exopthalmic goitre is a form of hyperthyroidism, characterised by enlargement of the thyroid gland, protrusion of the eyeballs, increased basal metabolic rate, and weight loss, also called Graves' disease. Thyroid gland also secretes a protein hormone called thyrocalcitonin (TCT) which regulates the blood calcium levels.

(New NCERT, 11th, Page No.-243)

152. (4)

Ascending limb of loop of Henle is impermeable to water but allows transport of electrolytes actively or passively.

(New NCERT, 11th, Page No.-209)

153. (4)

Releasing hormones (which stimulate secretion of pituitary hormones) and the inhibiting hormones (which inhibit secretions of pituitary hormones) are released from hypothalamus.

(New NCERT, 11th, Page No.-240)

154. (3)

Hypothalamus contains several groups of neurosecretory cells called nuclei which produce hormones.

(New NCERT, 11th, Page No.-240)

155. (4)

Each myosin (thick) filament is also a polymerised protein. Many monomeric proteins called Meromyosins constitute one thick filament.

(New NCERT, 11th, Page No.-221)

156. (3)

List-I	List-II
Gonadotropin releasing hormone	Hypothalamus
Thyroid stimulating hormone	Adenohypophysis
Antidiuretic hormone	Neurohypophysis
Melanocyte stimulating hormone	Pars intermedia

(New NCERT, 11th, Page No.-240, 241)

157. (4)

Aldosterone is the main mineralocorticoid produced by the adrenal cortex.

(New NCERT, 11th, Page No.-245)

158. (4)

Glucocorticoids stimulate gluconeogenesis, lipolysis and proteolysis; and inhibit cellular uptake and utilization of amino acids. They also produce anti-inflammatory reactions and suppresses the immune response.

(New NCERT, 11th, Page No.-245)

159. (1)

Glucagon acts mainly on the liver cells (hepatocytes) and stimulates glycogenolysis resulting in an increased blood sugar (hyperglycemia).

(New NCERT, 11th, Page No.-245)

160. (2)

The dorsal portion of the midbrain consists mainly of four round swellings (lobes) called corpora quadrigemina. They are reflex centers involving vision and hearing.

(New NCERT, 11th, Page No.-235, 236)

161. (3)

Adrenocorticotropic hormone (ACTH) stimulates the synthesis and secretion of steroid hormones called glucocorticoids from the adrenal cortex. ACTH is a tropic hormone produced by anterior pituitary.

(New NCERT, 11th, Page No.-241)

162. (2)

A sigmoid curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the pO_2. This curve is called the Oxygen dissociation curve and is highly useful in studying the effect of factors like pCO_2, H^+ concentration, etc., on binding of O_2 with haemoglobin.

(New NCERT, 11th, Page No.-189)

163. (4)

In females, LH induces ovulation of fully mature follicles (graafian follicles) and maintains the corpus luteum, formed from the remnants of the graafian follicles after ovulation. FSH stimulates growth and development of the ovarian follicles in females.

(New NCERT, 11th, Page No.-241)

164. (2)

LH and FSH stimulate gonadal activity and hence are called gonadotrophins. They are peptide hormone that regulate ovarian and testicular function and are essential for normal growth, sexual development and reproduction.

(New NCERT, 11th, Page No.-241)

165. (2)

In ABO system, blood group 'O' is considered as universal donor because it contains no antigen on RBCs. Therefore, a person with blood group 'O' can donate blood to other persons having A, B or AB blood groups.

(New NCERT, 11th, Page No.- 195)

166. (2)

The parathyroid glands secrete a peptide hormone called parathyroid hormone (PTH). The secretion of PTH is regulated by the circulating levels of calcium ions.

(New NCERT, 11th, Page No.-243)

167. (4)

Vasopressin acts mainly at the kidney and stimulates resorption of water and electrolytes by the distal tubules and thereby reduces loss of water through urine (diuresis). Hence, it is also called as anti-diuretic hormone (ADH).

(New NCERT, 11th, Page No.-242)

168. (4)

List-I	List-II
Inspiratory capacity	TV+IRV
Expiratory capacity	TV+ERV
Total lung capacity	RV+ERV+TV + IRV
Functional residual capacity	ERV+RV

(New NCERT, 11th, Page No.-187)

169. (3)

Pancreas is a composite gland which acts as both exocrine and endocrine gland. The endocrine pancreas consists of 'Islets of Langerhans', which represents 1-2 percent of pancreatic tissue. Two main types of cells i.e., alpha cells and beta cells are present in the Islets of Langerhans which secrete glucagon and insulin respectively.

(New NCERT, 11th, Page No.-245)

170. (4)

The androgens produce anabolic (synthetic) effects on protein and carbohydrate metabolism. This anabolic effect caused greatly increased deposition of protein everywhere in the body, especially in the muscles. Androgens therefore, stimulate muscular growth.

(New NCERT, 11th, Page No.-246)

171. (1)

The juxtaglomerular cells of kidney produce a peptide hormone called erythropoietin which stimulates erythropoiesis (formation of RBCs). Partial pressure of oxygen directly regulates the production of erythropoietin. The lower the pO_2, the greater the production of erythropoietin.

(New NCERT, 11th, Page No.-247)

172. (2)

Secretin acts on the exocrine pancreas and stimulates secretion of water and bicarbonate ions. When HCl passes from the stomach to the intestine (duodenum), secretin is released into the bloodstream and stimulates the duct cells of pancreas to secrete water and bicarbonates, which neutralize the acid and prevents intestinal lining.

(New NCERT, 11th, Page No.-247)

173. (4)

Fibrins are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin. Thrombin, in turn are formed from another inactive substance present in the plasma called prothrombin. An enzyme complex, thrombokinase, is required for conversion of prothrombin in to thrombin.

(New NCERT, 11th, Page No.-196)

174. (1)

The amount of the filtrate formed by the kidneys per minute is called glomerular filtration rate (GFR). GFR in a healthy individual is approximately 125 ml/minute, i.e., 180 litres per day.

(New NCERT, 11th, Page No.-209)

175. (1)

Steroid hormone	Cortisol, testosterone, estradiol
Amino acid derivatives	epinephrine
Iodothyronines	Thyroid hormones

(New NCERT, 11th, Page No.-248)

176. (1)

Hormones produce their effects on target tissues by binding to specific proteins called hormone receptors located in the target tissues only. These receptors can be present on cell membrane or in cytoplasm or in the cell's nucleus.

(New NCERT, 11th, Page No.-247)

177. (1)

Transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon. Electrical synapses contain channels that allow ions to flow from one cell to another.

(New NCERT, 11th, Page No.-234)

178. (2)

Prolonged hyperglycemia leads to a complex disorder called diabetes mellitus which is associated with loss of glucose through urine and formation of harmful compounds known as ketone bodies.

(New NCERT, 11th, Page No.-246)

179. (4)

The action potential spreads through the muscle fibre and causes the release of calcium ions into the sarcoplasm. Increase in Ca^{++} level leads to the binding of calcium with a subunit of troponin on actin filaments and thereby remove the masking of active sites for myosin. Utilising the energy from ATP hydrolysis, the myosin head now binds to the exposed active sites on actin to form a cross bridge.

(New NCERT, 11th, Page No.-222)

180. (3)

List-I	List-II
Hyperglycemic hormone	Glucagon
Hypoglycemic hormone	Insulin
Glucocorticoid	Cortisol
Mineralocorticoid	Aldosterone

(New NCERT, 11th, Page No.-245)

181. (2)

After ovulation, the ruptured follicle is converted to a structure called corpus luteum, which secretes mainly progesterone. This progesterone is essential for maintenance of endometrium.

(New NCERT, 11th, Page No.-246)

182. (4)

Amphibians and the reptiles (except crocodiles) have a 3-chambered heart with two atria and a single ventricle, whereas crocodiles, birds and mammals possess a 4-chambered heart with two atria and two ventricles.

(New NCERT, 11th, Page No.-197)

183. (2)

List-I	List-II
Acute renal failure	One or both kidneys do not function properly
Uremia	Excess of urea in blood
Renal calculi	Insoluble mass of crystalline salts
Glomerulonephritis	Inflammation of glomeruli

(New NCERT, 11th, Page No.-213, 214)

184. (3)

Thymosins play a major role in the differentiation of T-lymphocytes, which provide cell-mediated immunity. In addition, thymosins also promote production of antibodies to provide humoral immunity.

(New NCERT, 11th, Page No.- 243)

185. (2)

Gastrin acts on the gastric glands and stimulates the secretion of hydrochloric acid and pepsinogen. It is a peptide hormone primarily responsible for enhancing gastric mucosal growth and secretion of HCl into the stomach.

(New NCERT, 11th, Page No.-247)

SECTION-B

186. (4)

Hormones which interact with membrane-bound receptors normally do not enter the target cell, but generate second messengers (e.g., cyclic AMP, IP_3, Ca^{++} etc.) which in turn regulate cellular metabolism.

(New NCERT, 11th, Page No.-248)

187. (2)

An excessive loss of fluid from the body can activate these receptors which stimulate the hypothalamus to release antidiuretic hormone (ADH) or vasopressin from the neurohypophysis. ADH facilitates water reabsorption from latter part of the tubule, thereby preventing diuresis.

(New NCERT, 11th, Page No.-212)

188. (4)

The thymus gland is a lobular structure located between lungs behind sternum on the ventral side of aorta. The thymus plays a major role in the development of the immune system. This gland secretes the peptide hormones called thymosins.

(New NCERT, 11th, Page No.-243)

189. (4)

The skull, vertebral column, sternum and ribs constitute axial skeleton. It comprises 80 bones distributed along the main axis of the body.

(New NCERT, 11th, Page No.-224)

190. (2)

Hypothyroidism during pregnancy causes defective development and maturation of the growing baby leading to stunted growth (cretinism), mental retardation, low intelligence quotient, abnormal skin, deaf-mutism, etc.

(New NCERT, 11th, Page No.-242, 243)

191. (2)

The parathyroid glands secrete a peptide hormone called parathyroid hormone (PTH).

The secretion of PTH is regulated by the circulating levels of calcium ions.

(New NCERT, 11th, Page No.-243)

192. (4)

The axon is a long fibre, the distal end of which is branched. It typically conducts action potential away from the nerve cell body.

(New NCERT, 11th, Page No.-232)

193. (1)

Oxytocin acts on the smooth muscles of our body and stimulates their contraction. In females, it stimulates a vigorous contraction of uterus at the time of child birth, and milk ejection from the mammary gland.

(New NCERT, 11th, Page No.-242)

194. (1)

List-I	List-II
Larynx	Voice box
Trachea	Wind pipe
Alveoli	Air sacs
Epiglottis	Lid of larynx

(New NCERT, 11th, Page No.-184)

195. (2)

Our body has one pair of adrenal glands, one at the anterior part of each kidney which produces catecholamines (epinephrine and norepinephrine) from adrenal medulla and cortisol, aldosterone and androgens from adrenal cortex.

(New NCERT, 11th, Page No.-244, 245)

196. (2)

Glucocorticoids stimulate gluconeogenesis, lipolysis and proteolysis; and inhibit cellular uptake and utilization of amino acids. Cortisol is also involved in maintaining the cardio-vascular system as well as the kidney functions. Glucocorticoids, particularly cortisol, produces anti-inflammatory reactions and suppresses the immune response. Cortisol stimulates the RBC production.

(New NCERT, 11th, Page No.-245)

197. (3)

The atrial wall of our heart secretes a very important peptide hormone called atrial natriuretic factor (ANF), which decreases blood pressure. When blood pressure is increased, ANF is secreted which causes dilation of the blood vessels. This reduces the blood pressure.

(New NCERT, 11th, Page No.-247)

198. (1)

The α-cell secrete a hormone called glucagon which acts mainly on the liver cells (hepatocytes) and stimulates glycogenolysis resulting in an increased blood sugar.

(New NCERT, 11th, Page No.-245)

199. **(2)**

The nodal musculature has the ability to generate action potentials without any external stimuli, i.e., it is auto excitable.

The number of action potentials that could be generated in a minute vary at different parts of the nodal system.

(New NCERT, 11th, Page No.-199)

200. **(2)**

Gastric inhibitory peptide inhibits gastric secretion and motility. It is released by enteroendocrine cells in response to feeding and stimulates insulin release to regulate blood glucose and nutrient homeostasis.

(New NCERT, 11th, Page. No.-247)

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